



Lead-Based Paint Inspection & Risk Assessment Report

Project Location:

The Williams House
Lady Slipper Lane
Ivanhoe, Virginia 24350

Prepared For:

Mr. Mitchell Kerr, LS
Forest Land Surveyor
Forest Service
George Washington & Jefferson National Forests
5162 Valleypointe Parkway
Roanoke, Virginia 24019

Prepared By:

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Report Date: June 30, 2015

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EI Project Number: IHRO150106.00

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1.0 EXECUTIVE SUMMARY

United States Forest Service contracted with The EI Group, Inc (EI) to conduct a lead-based paint inspection and risk assessment of the Williams House located on Lady Slipper Lane in Ivanhoe, Virginia. Mr. Eric Cureton performed this survey on June 10, 2015. The scope of the survey included a comprehensive XRF analysis of interior and exterior painted surfaces, visual inspection, paint condition hazard ranking, and dust wipe sampling.

X-Ray Fluorescence (XRF) readings were collected in substantial conformance with industry standards and applicable federal and state regulations. Additionally, dust wipe samples and composite lead in soil samples were collected to identify potential lead based paint hazards.

Painted surfaces that contain greater than or equal to 1.0 milligrams of lead per square centimeter (mg/cm²) are considered to be lead-based paint, as defined by the Department of Housing and Urban Development (HUD), the Environmental Protection Agency (EPA) and the Department of Professional and Occupational Regulations (DPOR).

The following is a summary of the survey findings for the subject property:

Interior Lead-Based Paint

- No lead-based paint was identified on the interior of the residence.

Exterior Lead-Based Paint

- No lead-based paint was identified on the exterior of the residence.

Deteriorated Lead-Based Paint (Lead-Based Paint Hazards)

- No deteriorated lead-based paint was identified on the interior or exterior of the residence.

Lead in Dust Hazards

- No lead in dust hazards were identified.

Lead in Soil Hazards

- No lead in soil hazards were identified.

This executive summary has been prepared for the convenience of the users of this report. This summary does not contain all the information presented in this report and, therefore, the entire report should be read to assure all pertinent information is transmitted

2.0 INTRODUCTION

The EI Group, Inc. (*EI*), located in Roanoke, Virginia, was contracted as a third party to perform a lead-based paint inspection and risk assessment of the Williams House located on Lady Slipper Lane in Ivanhoe, Virginia. The residence is a one-story building with an unpainted attached garage built prior to 1978. The structure is conventional wood framing with brick exterior and wood siding and trim. The interior walls and ceilings are sheetrock with wood trim throughout. The property is a single-family home and is currently vacant. This evaluation was conducted at the request of Mr. Mitchell Kerr.

The inspection and risk assessment of the residence was performed on June 10, 2015 by Mr. Eric Cureton, (VA Lead-Based Paint Inspector/Risk Assessor Certification No. 3356-000811). The scope of the survey included a comprehensive XRF analysis of interior and exterior painted surfaces, visual inspection, paint condition hazard ranking, and dust wipe sampling. Eleven lead in dust wipe samples were collected in various locations throughout the interior the residence.

3.0 INSPECTION/ RISK ASSESSMENT METHODOLOGY

3.1 Surface-by-Surface Inspection Methodology

A surface-by-surface lead-based paint inspection was performed to identify interior and exterior building components finished with lead-based paint. The inspection was performed inside the residence and on exterior surfaces of the residence using a portable X-Ray Fluorescence Analyzer (XRF). The inspection was limited to accessible painted and/or varnished surfaces.

The inspection was conducted in accordance with the EPA's work practice standards for conducting lead-based paint activities (40 CFR 745.227), the U.S. Department of Housing and Urban Development (HUD) *Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing* (Guidelines) with the 2012 revisions, and the *Virginia Lead-Based Paint Activities Regulations* Title 54.1, Chapter 5 and local regulations. Samples were collected to represent component types; therefore it should be assumed that similar component types in the rest of that room or room equivalent also contain lead-based paint.

3.2 NITON XLp-300A Spectrum Analyzer Lead Detector

The sampling strategy utilized to determine the presence of lead-based paint adheres to the EPA Performance Characteristic Sheet for the particular XRF instrument used, as well as the manufacturers' modifications and recommendations. The NITON XLp-300A Spectrum Analyzer Lead Detector (Serial Number: 7066 40mCi) was used for detection of building components finished with lead-based paint. The instrument was manufactured by NITON Corporation, 900 Middlesex Turnpike, Building 8, Billerica, MA 01821.

Samples may be classified as POS (Positive), NEG (Negative), or NULL (Incomplete). Positive results indicate lead in quantities greater than 1.0 mg/cm² and are considered lead-based paint. Negative results indicate lead in quantities less than 1.0 mg/cm² and are not considered lead-based paint. However, detectable lead quantities less than 1.0 mg/cm² may create a lead dust hazard even though it is not a lead-based paint hazard. Null results should be ignored, as insufficient data was collected by the XRF analyzer during the sample time to determine if the sample is positive or negative (i.e. ~ instrument slipped or was removed prematurely, terminating the test).

When standing in any four-sided room facing side A, which coincides with the front of the dwelling, side B will be to the right, side C will be to the rear, and side D will be to the left (clockwise from side A). When evaluating this report it is assumed that, according to Chapter 7 HUD Guidelines, if one testing combination (i.e. window, door) is positive for lead in an interior or exterior room equivalent, all other similar testing combinations in those areas are assumed to be positive. The same is true for negative readings.

3.3 Risk Assessment Methodology

The lead-based paint risk assessment was performed to determine if the lead-based paint present in the residence presents an immediate hazard. This was accomplished through combining measurements of lead in dust, surface-by-surface paint analysis, visual assessment of the residence, assessment of paint condition, and by collecting maintenance and management data to identify and address lead-based paint hazards.

The risk assessment was performed in accordance with the EPA's work practice standards for conducting lead-based paint activities (40 CFR 745.227), the U.S. Department of Housing and Urban Development (HUD) *Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing* (Guidelines) with the 2012 revisions, and the *Virginia Lead-Based Paint Activities Regulations* Title 54.1, Chapter 5 and local regulations except that no composite dust wipe samples shall be allowed – only single-surface dust samples shall be collected.

3.4 Description of Paint Condition Hazard Rankings

The paint condition is placed into one of three categories using the risk assessor's professional judgment. These categories are: *intact or deteriorated*. Type of deterioration may also be noted on surfaces in *deteriorated* condition. Based on the approximate surface area of deteriorated paint, the risk assessor then assesses the paint condition as *intact or deteriorated*. These conditions indicate the potential for lead hazards associated with paint condition and lead in household dust.

Hazard ranking protocol was performed in accordance with the HUD Guidelines for Evaluation and Control of Lead-Based Paint Hazards in Housing, dated July, 2012, Chapter 5: Risk Assessment and Reevaluation; Identification of Deteriorated Paint (Form 5.2). This information is summarized below.

Deteriorated

EPA regulations define deteriorated paint as “any interior or exterior paint or other coating that is peeling, chipping, chalking, or cracking, or any paint or coating located on an interior or exterior surface or fixture that is otherwise damaged or separated from the substrate” (40 CFR 745.63).

3.5 Dust Wipe Sample Methodology

Dust wipe samples were collected from single surfaces throughout the residence to identify lead dust hazards. These samples were collected from areas where children are most likely to be exposed to dust that may present a lead hazard. Samples from the residence were collected from floors and window stools throughout the residence. Sample locations and results are indicated in Table 2. Copies of the laboratory results are included in Appendix B.

The EPA has established lead hazard standards for lead in dust under TSCA Section 403 (Residential Lead Hazards). The following level of lead in dust should be considered hazardous and may result in excessive lead exposure and elevated blood lead levels:

- 40 µg/ft² for floors, including carpeted floors
- 250 µg/ft² for interior window sills/window stools
- 400 µg/ft² for interior window troughs

3.6 Laboratory Analysis

Laboratory analysis of dust wipes samples were performed by an EPA NLLAP (National Lead Laboratory Accreditation Program) or AIHA ELLAP (Environmental Lead Laboratory Accreditation Program) approved laboratory. Laboratory analysis of the dust wipe samples was performed based on the EPA SW846-7420/ HUD – Flame Atomic Absorption.

4.0 DESCRIPTION OF RESULTS

This is a report of an X-ray Fluorescence (XRF) inspection and risk assessment to determine if lead-based paint exists in the readily accessible areas of this residence and tested components. The presence or absence of lead-based paint only applies to surfaces tested or assessed on the date of the field visit.

According to HUD/EPA Guidelines, paint with concentrations of lead that exceed 1.0 mg/cm² must be considered a lead-based paint (LBP). However, detectable lead in quantities less than 1.0 mg/cm² may contribute to the development of lead dust hazards even though it is not considered a lead-based paint hazard.

4.1 LBP Inspection

None of the surfaces on the interior or exterior of the property were coated with lead-based paint. When evaluating this report it is assumed that, according to Chapter 7 HUD Guidelines, if one testing combination (i.e. window, door) is positive for lead in an interior or exterior room equivalent, all other similar testing combinations in those areas are assumed to be positive. The same is true for negative readings.

4.2 LBP Risk Assessment

No lead-based paint was identified during the survey, and thus no deteriorated lead-based paint hazards were identified.

4.3 Dust Wipe Sample Analysis

The following tables note the presence or absence of lead hazards in dust per the EPA risk assessment and clearance standards. The presence of these hazards indicates that sample results exceed the following EPA criteria:

- 40 µg/ft² for floors, including carpeted floors
- 250 µg/ft² for interior window sills
- 400 µg/ft² for interior window troughs

The following table indicates the sample number, location, surface type, lead concentration, and presence or absence of lead dust hazards for dust wipe samples collected during this LBP Risk Assessment:

Table 1: Dust Wipe Sample Analysis				
Sample #	Location	Surface Types	Concentration (micrograms/ft ²)	Lead Hazard
106-01	Room #1 (Living Room)	Floor	<10<10	NONO
106-02	Room #1 (Living Room)	Window Sill	<15<15	NONO
106-03	Room #2 (Kitchen)	Floor	<10<10	NONO
106-04	Room #2 (Kitchen)	Window Sill	<19<19	NONO
106-05	Room #4 (Bedroom)	Floor	<10<10	NONO
106-06	Room #4 (Bedroom)	Window Sill	<16<16	NONO
106-07	Room #5 (Bedroom)	Floor	<10<10	NONO
106-08	Room #5 (Bedroom)	Window Sill	<16<16	NONO
106-09	Room #6 (Bedroom)	Floor	<10<10	NONO
106-10	Room #6 (Bedroom)	Window Sill	<16<16	NONO
106-11	BLANK	N/A	<10<10 µg	N/AN/A

4.4 Soil Sample Methodology

The EPA has established lead hazard standards for lead in soil under TSCA Section 403 (Residential Lead Hazards). The following level of lead in soil should be considered hazardous and may result in excessive lead exposure and elevated blood lead levels:

- 400 milligrams per kilogram (mg/Kg) in children's play areas with bare residential soil (e.g., sandboxes, gardens)
- 1,200 mg/Kg (average) in bare soil for the remainder of the yard.

No areas of bare soil were identified along the drip line of the residence or in the remainder of the yard, thus no soil samples were collected during this survey.

5.0 RECOMMENDATIONS

5.1 Lead-Based Paint

No lead-based paint was identified during this survey.

5.2 Deteriorated Lead-Based Paint

No Lead-based paint, deteriorated or otherwise, was identified during this survey.

5.3 Lead Dust Control Options

No lead dust hazards were identified during this survey.

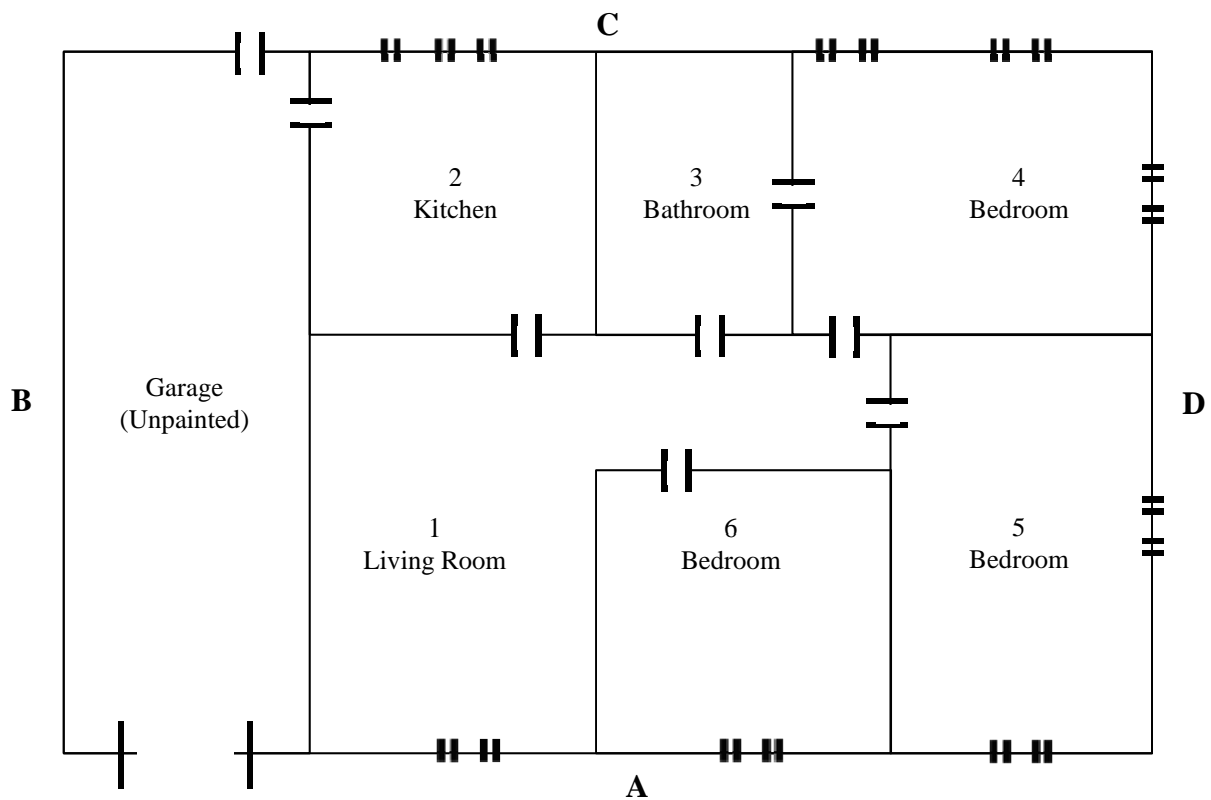
5.4 Lead in Soil

No Lead soil hazards were identified during this survey.

APPENDICES

APPENDIX A:

Floor Plan & XRF Field Data Sheets



PROPERTY SITE DRAWING

DRAWN BY: Joe Tinaglia

PROJECT NUMBER: IHRO150106.00

SCALE: No Scale

SAMPLE LOCATIONS

Williams House
Lady Slipper Lane
Ivanhoe, VA 24350





Index	Time	Units	Component	Substrate	Side	Condition	Color	Site	Room	Results	PbC
1	2015-06-10 09:30	cps									6.36 ± 0.00
2	2015-06-10 09:47	mg / cm ^2	calibrate					Lady Slipper Lane		Positive	1.00 ± 0.10
3	2015-06-10 09:49	mg / cm ^2	calibrate					Lady Slipper Lane		Positive	1.00 ± 0.10
4	2015-06-10 09:50	mg / cm ^2	calibrate					Lady Slipper Lane		Null	1.00 ± 0.10
5	2015-06-10 09:55	mg / cm ^2	soffit	WOOD	A	POOR	WHITE	Lady Slipper Lane	exterior	Negative	0.00 ± 0.02
6	2015-06-10 09:55	mg / cm ^2	Fascia	WOOD	A	POOR	WHITE	Lady Slipper Lane	exterior	Negative	0.00 ± 0.02
7	2015-06-10 09:55	mg / cm ^2	Upper Trim	WOOD	A	POOR	WHITE	Lady Slipper Lane	exterior	Negative	0.00 ± 0.02
8	2015-06-10 09:56	mg / cm ^2	Door Casing	WOOD	A	POOR	WHITE	Lady Slipper Lane	exterior	Negative	0.00 ± 0.02
9	2015-06-10 10:01	mg / cm ^2	WINDOW SHUTTER	WOOD	A	FAIR	RED	Lady Slipper Lane	exterior	Negative	0.01 ± 0.05
10	2015-06-10 10:02	mg / cm ^2	GARAGE DOOR	WOOD	A	FAIR	WHITE	Lady Slipper Lane	exterior	Negative	0.00 ± 0.02
11	2015-06-10 10:03	mg / cm ^2	GARAGE DOOR CASING	WOOD	A	FAIR	WHITE	Lady Slipper Lane	exterior	Negative	0.00 ± 0.03
12	2015-06-10 10:04	mg / cm ^2	WINDOW CASING	WOOD	A	FAIR	WHITE	Lady Slipper Lane	exterior	Negative	0.00 ± 0.02
13	2015-06-10 10:05	mg / cm ^2	WALL	METAL	B	POOR	WHITE	Lady Slipper Lane	exterior	Negative	0.02 ± 0.14
14	2015-06-10 10:05	mg / cm ^2	WINDOW CASING	WOOD	B	POOR	WHITE	Lady Slipper Lane	exterior	Negative	0.00 ± 0.02
15	2015-06-10 10:06	mg / cm ^2	WALL	WOOD	C	POOR	WHITE	Lady Slipper Lane	exterior	Negative	0.00 ± 0.03
16	2015-06-10 10:07	mg / cm ^2	DOOR CASING	WOOD	C	POOR	WHITE	Lady Slipper Lane	exterior	Negative	0.00 ± 0.02
17	2015-06-10 10:07	mg / cm ^2	DOOR	WOOD	C	POOR	WHITE	Lady Slipper Lane	exterior	Negative	0.00 ± 0.02
18	2015-06-10 10:08	mg / cm ^2	WINDOW CASING	WOOD	C	POOR	WHITE	Lady Slipper Lane	exterior	Negative	0.00 ± 0.02
19	2015-06-10 10:09	mg / cm ^2	WINDOW SASH	WOOD	C	POOR	WHITE	Lady Slipper Lane	exterior	Negative	0.00 ± 0.02
20	2015-06-10 10:10	mg / cm ^2	WALL	WOOD	D	POOR	WHITE	Lady Slipper Lane	exterior	Negative	0.00 ± 0.02
21	2015-06-10 10:10	mg / cm ^2	CRAWL SPACE DOOR	WOOD	D	POOR	WHITE	Lady Slipper Lane	exterior	Negative	0.00 ± 0.03
22	2015-06-10 10:11	mg / cm ^2	WINDOW SHUTTER	WOOD	D	POOR	RED	Lady Slipper Lane	exterior	Negative	0.01 ± 0.03
23	2015-06-10 10:11	mg / cm ^2	WINDOW CASING	WOOD	D	POOR	RED	Lady Slipper Lane	exterior	Negative	0.00 ± 0.02
24	2015-06-10 10:14	mg / cm ^2	WALL	DRYWALL	A	FAIR	WHITE	Lady Slipper Lane	ROOM 01	Negative	0.00 ± 0.02
25	2015-06-10 10:14	mg / cm ^2	WALL	DRYWALL	B	FAIR	WHITE	Lady Slipper Lane	ROOM 01	Negative	0.00 ± 0.02
26	2015-06-10 10:14	mg / cm ^2	WALL	DRYWALL	B	FAIR	WHITE	Lady Slipper Lane	ROOM 01	Negative	0.00 ± 0.02
27	2015-06-10 10:14	mg / cm ^2	WALL	DRYWALL	C	FAIR	WHITE	Lady Slipper Lane	ROOM 01	Negative	0.00 ± 0.03
28	2015-06-10 10:15	mg / cm ^2	WALL	DRYWALL	D	FAIR	WHITE	Lady Slipper Lane	ROOM 01	Negative	0.00 ± 0.02
29	2015-06-10 10:15	mg / cm ^2	WALL	DRYWALL	D	FAIR	WHITE	Lady Slipper Lane	ROOM 01	Negative	0.00 ± 0.02
30	2015-06-10 10:16	mg / cm ^2	CEILING	DRYWALL		FAIR	WHITE	Lady Slipper Lane	ROOM 01	Negative	0.00 ± 0.02
31	2015-06-10 10:16	mg / cm ^2	BASEBOARD	WOOD		FAIR	varnish	Lady Slipper Lane	ROOM 01	Negative	0.00 ± 0.02
32	2015-06-10 10:17	mg / cm ^2	WINDOW SASH	WOOD	A	FAIR	varnish	Lady Slipper Lane	ROOM 01	Negative	0.00 ± 0.02
33	2015-06-10 10:17	mg / cm ^2	WINDOW CASING	WOOD	A	FAIR	varnish	Lady Slipper Lane	ROOM 01	Negative	0.00 ± 0.02
34	2015-06-10 10:18	mg / cm ^2	DOOR CASING	WOOD	A	FAIR	varnish	Lady Slipper Lane	ROOM 01	Negative	0.00 ± 0.02



Index	Time	Units	Component	Substrate	Side	Condition	Color	Site	Room	Results	PbC
35	2015-06-10 10:19	mg / cm ^2	CLOSET DOOR	WOOD	D	FAIR	varnish	Lady Slipper Lane	ROOM 01	Negative	0.00 ± 0.03
36	2015-06-10 10:20	mg / cm ^2	CLOSET DOOR CASING	WOOD	D	FAIR	varnish	Lady Slipper Lane	ROOM 01	Negative	0.00 ± 0.02
37	2015-06-10 10:20	mg / cm ^2	CLOSET WALL	DRYWALL	D	FAIR	WHITE	Lady Slipper Lane	ROOM 01	Null	0.00 ± 0.02
38	2015-06-10 10:21	mg / cm ^2	CLOSET WALL	DRYWALL	D	FAIR	WHITE	Lady Slipper Lane	ROOM 01	Null	0.00 ± 0.03
39	2015-06-10 10:21	mg / cm ^2	CLOSET WALL	DRYWALL	D	FAIR	WHITE	Lady Slipper Lane	ROOM 01	Negative	0.00 ± 0.02
40	2015-06-10 10:22	mg / cm ^2	WALL	DRYWALL	A	FAIR	WHITE	Lady Slipper Lane	ROOM 02	Negative	0.01 ± 0.05
41	2015-06-10 10:22	mg / cm ^2	WALL	WOOD	B	FAIR	WHITE	Lady Slipper Lane	ROOM 02	Negative	0.00 ± 0.02
42	2015-06-10 10:23	mg / cm ^2	WALL	WOOD	C	FAIR	WHITE	Lady Slipper Lane	ROOM 02	Negative	0.00 ± 0.02
43	2015-06-10 10:23	mg / cm ^2	WALL	WOOD	D	FAIR	WHITE	Lady Slipper Lane	ROOM 02	Negative	0.00 ± 0.02
44	2015-06-10 10:23	mg / cm ^2	CEILING	DRYWALL		FAIR	WHITE	Lady Slipper Lane	ROOM 02	Negative	0.00 ± 0.02
45	2015-06-10 10:24	mg / cm ^2	BASEBOARD	WOOD		FAIR	varnish	Lady Slipper Lane	ROOM 02	Negative	0.00 ± 0.03
46	2015-06-10 10:25	mg / cm ^2	DOOR THRESHOLD	WOOD	B	FAIR	GREY	Lady Slipper Lane	ROOM 02	Negative	0.06 ± 0.24
47	2015-06-10 10:27	mg / cm ^2	WINDOW CASING	WOOD	C	FAIR	VARNISH	Lady Slipper Lane	ROOM 02	Negative	0.00 ± 0.02
48	2015-06-10 10:28	mg / cm ^2	WINDOW SASH	WOOD	C	FAIR	VARNISH	Lady Slipper Lane	ROOM 02	Negative	0.00 ± 0.02
49	2015-06-10 10:28	mg / cm ^2	WINDOW TROUGH	WOOD	C	FAIR	WHITE	Lady Slipper Lane	ROOM 02	Null	0.06 ± 0.54
50	2015-06-10 10:28	mg / cm ^2	WINDOW TROUGH	WOOD	C	FAIR	WHITE	Lady Slipper Lane	ROOM 02	Negative	0.00 ± 0.02
51	2015-06-10 10:30	mg / cm ^2	CABINET	WOOD	D	FAIR	WHITE	Lady Slipper Lane	ROOM 02	Negative	0.01 ± 0.04
52	2015-06-10 10:30	mg / cm ^2	CLOSET DOOR CASING	WOOD	B	FAIR	varnish	Lady Slipper Lane	ROOM 02	Negative	0.00 ± 0.02
53	2015-06-10 10:31	mg / cm ^2	CLOSET DOOR	WOOD	B	FAIR	varnish	Lady Slipper Lane	ROOM 02	Negative	0.00 ± 0.02
54	2015-06-10 10:32	mg / cm ^2	CLOSET WALL	DRYWALL	B	FAIR	varnish	Lady Slipper Lane	ROOM 02	Negative	0.00 ± 0.02
55	2015-06-10 10:33	mg / cm ^2	WALL	DRYWALL	A	FAIR	GREEN	Lady Slipper Lane	ROOM 03	Null	0.00 ± 0.03
56	2015-06-10 10:33	mg / cm ^2	WALL	DRYWALL	A	FAIR	GREEN	Lady Slipper Lane	ROOM 03	Null	0.00 ± 0.02
57	2015-06-10 10:34	mg / cm ^2	WALL	DRYWALL	A	FAIR	GREEN	Lady Slipper Lane	ROOM 03	Negative	0.00 ± 0.02
58	2015-06-10 10:34	mg / cm ^2	WALL	DRYWALL	B	FAIR	GREEN	Lady Slipper Lane	ROOM 03	Negative	0.00 ± 0.02
59	2015-06-10 10:35	mg / cm ^2	WALL	DRYWALL	C	FAIR	GREEN	Lady Slipper Lane	ROOM 03	Negative	0.01 ± 0.03
60	2015-06-10 10:35	mg / cm ^2	WALL	DRYWALL	D	FAIR	GREEN	Lady Slipper Lane	ROOM 03	Negative	0.00 ± 0.02
61	2015-06-10 10:37	mg / cm ^2	CEILING	DRYWALL		FAIR	WHITE	Lady Slipper Lane	ROOM 03	Null	0.00 ± 0.02
62	2015-06-10 10:37	mg / cm ^2	CEILING	DRYWALL		FAIR	WHITE	Lady Slipper Lane	ROOM 03	Negative	0.00 ± 0.02
63	2015-06-10 10:38	mg / cm ^2	BASEBOARD	WOOD		FAIR	varnish	Lady Slipper Lane	ROOM 03	Negative	0.00 ± 0.02
64	2015-06-10 10:38	mg / cm ^2	DOOR	WOOD	A	FAIR	varnish	Lady Slipper Lane	ROOM 03	Negative	0.00 ± 0.02
65	2015-06-10 10:38	mg / cm ^2	DOOR	WOOD	D	FAIR	varnish	Lady Slipper Lane	ROOM 03	Null	0.00 ± 0.02
66	2015-06-10 10:39	mg / cm ^2	DOOR	WOOD	D	FAIR	varnish	Lady Slipper Lane	ROOM 03	Negative	0.00 ± 0.02
67	2015-06-10 10:39	mg / cm ^2	DOOR CASING	WOOD	D	FAIR	varnish	Lady Slipper Lane	ROOM 03	Negative	0.00 ± 0.02
68	2015-06-10 10:40	mg / cm ^2	CLOSET CASING	WOOD	B	FAIR	varnish	Lady Slipper Lane	ROOM 03	Negative	0.00 ± 0.02



Index	Time	Units	Component	Substrate	Side	Condition	Color	Site	Room	Results	PbC
69	2015-06-10 10:40	mg / cm ^2	CLOSET DOOR	WOOD	B	FAIR	varnish	Lady Slipper Lane	ROOM 03	Negative	0.00 ± 0.02
70	2015-06-10 10:41	mg / cm ^2	CLOSET WALL	DRYWALL	B	FAIR	WHITE	Lady Slipper Lane	ROOM 03	Negative	0.00 ± 0.02
71	2015-06-10 10:42	mg / cm ^2	CABINET	WOOD	B	FAIR	WHITE	Lady Slipper Lane	ROOM 03	Negative	0.00 ± 0.02
72	2015-06-10 10:43	mg / cm ^2	WALL	DRYWALL	A	FAIR	BLUE	Lady Slipper Lane	ROOM 04	Negative	0.00 ± 0.02
73	2015-06-10 10:43	mg / cm ^2	WALL	DRYWALL	B	FAIR	BLUE	Lady Slipper Lane	ROOM 04	Negative	0.00 ± 0.02
74	2015-06-10 10:43	mg / cm ^2	WALL	DRYWALL	C	FAIR	BLUE	Lady Slipper Lane	ROOM 04	Negative	0.00 ± 0.02
75	2015-06-10 10:43	mg / cm ^2	WALL	DRYWALL	D	FAIR	BLUE	Lady Slipper Lane	ROOM 04	Null	0.00 ± 0.02
76	2015-06-10 10:44	mg / cm ^2	WALL	DRYWALL	D	FAIR	BLUE	Lady Slipper Lane	ROOM 04	Negative	0.00 ± 0.02
77	2015-06-10 10:44	mg / cm ^2	CEILING	DRYWALL		FAIR	BLUE	Lady Slipper Lane	ROOM 04	Negative	0.00 ± 0.02
78	2015-06-10 10:45	mg / cm ^2	CEILING	DRYWALL		FAIR	BLUE	Lady Slipper Lane	ROOM 04	Negative	0.01 ± 0.04
79	2015-06-10 10:46	mg / cm ^2	BASEBOARD	WOOD		FAIR	varnish	Lady Slipper Lane	ROOM 04	Negative	0.00 ± 0.03
80	2015-06-10 10:47	mg / cm ^2	BASEBOARD	WOOD	A	FAIR	varnish	Lady Slipper Lane	ROOM 04	Negative	0.00 ± 0.02
81	2015-06-10 10:48	mg / cm ^2	door	WOOD	A	FAIR	varnish	Lady Slipper Lane	ROOM 04	Negative	-0.46 ± 1.32
82	2015-06-10 10:49	mg / cm ^2	window sash	WOOD	C	FAIR	varnish	Lady Slipper Lane	ROOM 04	Negative	0.00 ± 0.02
83	2015-06-10 10:49	mg / cm ^2	window casing	WOOD	C	FAIR	varnish	Lady Slipper Lane	ROOM 04	Negative	0.00 ± 0.02
84	2015-06-10 10:50	mg / cm ^2	closet door	WOOD	A	FAIR	varnish	Lady Slipper Lane	ROOM 04	Negative	0.00 ± 0.02
85	2015-06-10 10:51	mg / cm ^2	closet door casing	WOOD	A	FAIR	varnish	Lady Slipper Lane	ROOM 04	Null	0.00 ± 0.02
86	2015-06-10 10:51	mg / cm ^2	closet door casing	WOOD	A	FAIR	varnish	Lady Slipper Lane	ROOM 04	Negative	0.00 ± 0.02
87	2015-06-10 10:51	mg / cm ^2	closet door casing	WOOD	A	FAIR	varnish	Lady Slipper Lane	ROOM 04	Negative	0.00 ± 0.02
88	2015-06-10 10:52	mg / cm ^2	closet door casing	DRYWALL	A	FAIR	WHITE	Lady Slipper Lane	ROOM 04	Negative	0.00 ± 0.02
89	2015-06-10 10:53	mg / cm ^2	WALL	DRYWALL	A	FAIR	WHITE	Lady Slipper Lane	ROOM 05	Null	0.00 ± 0.04
90	2015-06-10 10:53	mg / cm ^2	WALL	DRYWALL	A	FAIR	WHITE	Lady Slipper Lane	ROOM 05	Negative	0.01 ± 0.05
91	2015-06-10 10:53	mg / cm ^2	WALL	DRYWALL	B	FAIR	WHITE	Lady Slipper Lane	ROOM 05	Negative	0.00 ± 0.02
92	2015-06-10 10:54	mg / cm ^2	WALL	DRYWALL	C	FAIR	WHITE	Lady Slipper Lane	ROOM 05	Negative	0.00 ± 0.02
93	2015-06-10 10:54	mg / cm ^2	WALL	DRYWALL	D	FAIR	WHITE	Lady Slipper Lane	ROOM 05	Negative	0.03 ± 0.11
94	2015-06-10 10:55	mg / cm ^2	CEILING	DRYWALL		FAIR	WHITE	Lady Slipper Lane	ROOM 05	Negative	0.02 ± 0.08
95	2015-06-10 10:56	mg / cm ^2	BASEBOARD	WOOD		FAIR	varnish	Lady Slipper Lane	ROOM 05	Negative	0.00 ± 0.02
96	2015-06-10 10:57	mg / cm ^2	WINDOW SASH	WOOD	A	FAIR	varnish	Lady Slipper Lane	ROOM 05	Negative	0.00 ± 0.02
97	2015-06-10 10:57	mg / cm ^2	WINDOW CASIng	WOOD	A	FAIR	varnish	Lady Slipper Lane	ROOM 05	Negative	0.00 ± 0.02
98	2015-06-10 10:58	mg / cm ^2	closet door casing	WOOD	C	FAIR	varnish	Lady Slipper Lane	ROOM 05	Negative	0.00 ± 0.03
99	2015-06-10 10:59	mg / cm ^2	closet door	WOOD	C	FAIR	varnish	Lady Slipper Lane	ROOM 05	Negative	0.00 ± 0.02
100	2015-06-10 10:59	mg / cm ^2	closet wall	DRYWALL	C	FAIR	varnish	Lady Slipper Lane	ROOM 05	Negative	0.00 ± 0.02
101	2015-06-10 11:00	mg / cm ^2	DOOR	WOOD	B	FAIR	varnish	Lady Slipper Lane	ROOM 05	Negative	0.02 ± 0.18
102	2015-06-10 11:01	mg / cm ^2	DOOR CASING	WOOD	B	FAIR	varnish	Lady Slipper Lane	ROOM 05	Negative	0.00 ± 0.02



Index	Time	Units	Component	Substrate	Side	Condition	Color	Site	Room	Results	PbC
103	2015-06-10 11:02	mg / cm ^2	WALL	DRYWALL	A	FAIR	BEIGE	Lady Slipper Lane	ROOM 06	Negative	0.00 ± 0.02
104	2015-06-10 11:02	mg / cm ^2	WALL	DRYWALL	B	FAIR	BEIGE	Lady Slipper Lane	ROOM 06	Negative	0.01 ± 0.04
105	2015-06-10 11:02	mg / cm ^2	WALL	DRYWALL	C	FAIR	BEIGE	Lady Slipper Lane	ROOM 06	Negative	0.00 ± 0.02
106	2015-06-10 11:03	mg / cm ^2	WALL	DRYWALL	D	FAIR	BEIGE	Lady Slipper Lane	ROOM 06	Negative	0.00 ± 0.02
107	2015-06-10 11:03	mg / cm ^2	CEILING	DRYWALL		FAIR	BEIGE	Lady Slipper Lane	ROOM 06	Negative	0.00 ± 0.02
108	2015-06-10 11:04	mg / cm ^2	BASEBOARD	WOOD		FAIR	varnish	Lady Slipper Lane	ROOM 06	Negative	0.00 ± 0.03
109	2015-06-10 11:05	mg / cm ^2	WINDOW casing	WOOD	A	FAIR	varnish	Lady Slipper Lane	ROOM 06	Negative	0.00 ± 0.02
110	2015-06-10 11:06	mg / cm ^2	WINDOW sash	WOOD	A	FAIR	varnish	Lady Slipper Lane	ROOM 06	Negative	0.00 ± 0.02
111	2015-06-10 11:06	mg / cm ^2	closet door casing	WOOD	B	FAIR	varnish	Lady Slipper Lane	ROOM 06	Negative	0.01 ± 0.04
112	2015-06-10 11:07	mg / cm ^2	closet door	WOOD	B	FAIR	varnish	Lady Slipper Lane	ROOM 06	Negative	0.00 ± 0.02
113	2015-06-10 11:07	mg / cm ^2	closet wall	DRYWALL	B	FAIR	WHITE	Lady Slipper Lane	ROOM 06	Negative	0.00 ± 0.02
114	2015-06-10 11:08	mg / cm ^2	DOOR	WOOD	C	FAIR	varnish	Lady Slipper Lane	ROOM 06	Negative	0.00 ± 0.03
115	2015-06-10 11:08	mg / cm ^2	DOOR CASING	WOOD	C	FAIR	varnish	Lady Slipper Lane	ROOM 06	Negative	0.00 ± 0.03
116	2015-06-10 11:12	mg / cm ^2	CALIBRATE					Lady Slipper Lane		Positive	1.00 ± 0.10
117	2015-06-10 11:13	mg / cm ^2	CALIBRATE					Lady Slipper Lane		Negative	0.90 ± 0.10
118	2015-06-10 11:16	mg / cm ^2	CALIBRATE					Lady Slipper Lane		Positive	1.00 ± 0.10

APPENDIX B:
Dust Wipe Analysis

**EMSL Analytical, Inc.**

706 Gralin Street, Kernersville, NC 27284

Phone/Fax: (336) 992-1025 / (336) 992-4175

<http://www.EMSL.com>greensborolab@emsl.com

EMSL Order: 021503042

CustomerID: EINV62

CustomerPO:

ProjectID:

Attn: **Eric Cureton**
The EI Group, Inc.
15 Salem Avenue Southeast
Suite 301
Roanoke, VA 24011

Phone: (540) 343-9595
Fax: (540) 343-5902
Received: 06/11/15 12:15 PM
Collected:

Project: **IHRO150106.00****Test Report: Lead in Dust by Flame AAS (SW 846 3050B/7000B)***

<i>Client Sample Description</i>	<i>Lab ID</i>	<i>Collected</i>	<i>Analyzed</i>	<i>Area Sampled</i>	<i>Lead Concentration</i>
106-01	021503042-0001	6/12/2015	144 in ²		<10 µg/ft ²
106-02	021503042-0002	6/12/2015	97.5 in ²		<15 µg/ft ²
106-03	021503042-0003	6/12/2015	144 in ²		<10 µg/ft ²
106-04	021503042-0004	6/12/2015	77.5 in ²		<19 µg/ft ²
106-05	021503042-0005	6/12/2015	144 in ²		<10 µg/ft ²
106-06	021503042-0006	6/12/2015	87.5 in ²		<16 µg/ft ²
106-07	021503042-0007	6/12/2015	144 in ²		<10 µg/ft ²
106-08	021503042-0008	6/12/2015	87.5 in ²		<16 µg/ft ²
106-09	021503042-0009	6/12/2015	144 in ²		<10 µg/ft ²
106-10	021503042-0010	6/12/2015	87.5 in ²		<16 µg/ft ²
106-11	021503042-0011	6/12/2015	n/a		<10 µg/wipe

James Cole, Laboratory Manager
or other approved signatory

*Analysis following Lead in Dust by EMSL SOP/ Determination of Environmental Lead by FLAA. Reporting limit is 10 ug/wipe. ug/wipe = ug/ft² x area sampled in ft². Unless noted, results in this report are not blank corrected. This report relates only to the samples reported above and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities (such as volume sampled) or analytical method limitations. Samples received in good condition unless otherwise noted. The lab is not responsible for data reported in µg/ft² which is dependant on the area provided by non-lab personnel. The test results contained within this report meet the requirements of NELAC unless otherwise noted. "<" (less than) results signifies that the analyte was not detected at or above the reporting limit. Measurement of uncertainty is available upon request. The QC data associated with the sample results included in this report meet the recovery and precision requirements established by the AIHA-LAP, unless specifically indicated otherwise

Samples analyzed by EMSL Analytical, Inc. Kernersville, NC EMSL Lab ID 102564 is accredited by the AIHA Laboratory Accreditation Program (AIHA-LAP), LLC in the Environmental Lead accreditation program for Lead in Dust.

Initial report from 06/15/2015 09:24:58

EMSL ANALYTICAL, INC.
LABORATORY PRODUCTS TRAINING

Lead (Pb) Chain of Custody

EMSL Order ID (Lab Use Only):

3042

EMSL ANALYTICAL, INC.
200 ROUTE 130 NORTH
CINCINNATI, NJ 08077
PHONE: (800) 220-3675
FAX: (856) 786-5974

Company: The EI Group, Inc.		EMSL Bill to: <input type="checkbox"/> Same <input type="checkbox"/> Different If Bill to is Different note instructions in Comments**	
Street: 15 Salem Ave SE - Suite 301		Third Party Billing requires written authorization from third party	
City: Roanoke	State/Province: VA	Zip/Postal Code: 24011	Country: USA
Report To (Name): Eric Cureton		Telephone #: 540-343-9595	
Email Address: ecureton@ei1.com		Fax #: 540-343-5902	
Project Name/Number: IIR0150106 00		Purchase Order:	
U.S. State Samples Taken: VA		Please Provide Results: <input type="checkbox"/> Fax <input checked="" type="checkbox"/> Email	
		CT Samples: <input type="checkbox"/> Commercial/Taxable <input type="checkbox"/> Residential/Tax Exempt	
Turnaround Time (TAT) Options* - Please Check			
<input type="checkbox"/> 3 Hour <input type="checkbox"/> 8 Hour <input type="checkbox"/> 24 Hour <input type="checkbox"/> 48 Hour <input checked="" type="checkbox"/> 72 Hour <input type="checkbox"/> 96 Hour <input type="checkbox"/> 1 Week <input type="checkbox"/> 2 Week			
*Analysis completed in accordance with EMSL's Terms and Conditions located in the Price Guide			
Matrix	Method	Instrument	Reporting Limit
Chips <input type="checkbox"/> % by wt. <input type="checkbox"/> mg/cm ² <input type="checkbox"/> ppm	SW846-7000B	Flame Atomic Absorption	0.01%
Air	NIOSH 7082	Flame Atomic Absorption	4 µg/filter
	NIOSH 7105	Graphite Furnace AA	0.03 µg/filter
	NIOSH 7300 modified	ICP-AES/ICP-MS	0.5 µg/filter
Wipe* <input checked="" type="checkbox"/> ASTM non ASTM <input type="checkbox"/> *If no box is checked, non-ASTM Wipe is assumed	SW846-7000B	Flame Atomic Absorption	10 µg/wipe
	SW846-6010B or C	ICP-AES	1.0 µg/wipe
TCLP	SW846-1311/7000B/SM 3111B	Flame Atomic Absorption	0.4 mg/L (ppm)
	SW846-1131/SW846-6010B or C	ICP-AES	0.1 mg/L (ppm)
Soil	SW846-7000B	Flame Atomic Absorption	40 mg/kg (ppm)
	SW846-6010B or C	ICP-AES	2 mg/kg (ppm)
Wastewater Unpreserved <input type="checkbox"/> Preserved with HNO ₃ pH < 2 <input type="checkbox"/>	SM3111B/SW846-7000B	Flame Atomic Absorption	0.4 mg/L (ppm)
	EPA 200.9	Graphite Furnace AA	0.003 mg/L (ppm)
	EPA 200.7	ICP-AES	0.020 mg/L (ppm)
Drinking Water Unpreserved <input type="checkbox"/> Preserved with HNO ₃ pH < 2 <input type="checkbox"/>	EPA 200.9	Graphite Furnace AA	0.003 mg/L (ppm)
	EPA 200.8	ICP-MS	0.001 mg/L (ppm)
TSP/SPM Filter	40 CFR Part 50 (2013)	ICP-MS	1.2 µg/filter
Other			
Name of Sampler:		Signature of Sampler	
Sample #	Location	Volume/Area	Date/Time Sampled
106-01	Rm 01 - floor	144 in ²	6/10/15 10:00 am
106-02	Rm 01 - Window Sill	97.5 in ²	
106-03	Rm 02 - floor	144 in ²	
106-04	Rm 02 - Window Sill	77.5 in ²	
106-05	Rm 04 - floor	144 in ²	
Client Sample #'s: 106-01 to 106-11		Total # of Samples: 11	
Relinquished (Client):	Date: 6/10/2015	Time: 17:00	
Received (Lab):	Date: 6-11-15	Time: 12:15	
Comments: Ex Ground 780799827536			

3042

Page 2 Of 2

APPENDIX C:

Summary Notice of LBP Risk Assessment

NOTICE OF LEAD HAZARD EVALUATION

Property Address: Williams House – Lady Slipper Lane, Ivanhoe, VA 24350

Risk Assessment and Lead-Based Paint Inspection

Assessment/Inspection Date: 06/10/2015

Summary of Results: X No lead-based paint or lead-based paint hazards were found.

____ Lead-based paint hazards were found.

Contact person for more information about the Risk Assessment:

Printed Name: Mr. Eric Cureton, Manager Roanoke Operations

Organization: The EI Group, Inc.

Street: 15 Salem Avenue SE – Suite 301

City, State & Zip: Roanoke, Virginia, 24011

Phone #: (540)343-9595

Person who prepared this Notice:

Printed name: Mr. Eric Cureton, Manager Roanoke Operations

Signature: 

Date: 6/12/2015

Organization: The EI Group, Inc.

Street: 15 Salem Avenue SE – Suite 301

City, State & Zip: Roanoke, Virginia 24011

Phone #: (540)343-9595

Summarize the types and locations of lead-based paint hazards below or attach your own summary. The summary must list at least the bare soil locations, dust-lead locations, and/or building components (including type of room or space and the material underneath the paint), and types of lead-based paint hazards found:

<u>Contaminated Soil</u>		
Area	mg/g (ppm)	Location
<u>X</u> None		
___ Perimeter	___ mg/Kg	
___ Play Area	___ mg/Kg	
___ Other	___ mg/Kg	

<u>Contaminated Dust</u>		
Area	µg/ft ²	Location
<u>X</u> None		
___ Window Sill	___ µg/ft ²	
___ Floor	___ µg/ft ²	
___ Other	___ µg/ft ²	

[illegible]

APPENDIX D:

Lead Definitions

Lead Definitions

COMMON LEAD-BASED PAINT TERMS

Lead-Based Paint: Paint that contains at least 1 milligram per centimeter square (mg/cm²) of lead. Also measured as greater than 0.5 percent lead or has 5,000 parts per million (ppm) lead by dry weight.

Lead-Based Paint Hazards: Housing conditions that cause human exposure to unsafe levels of lead from paint. These conditions include deteriorated lead-based paint; friction, impact or chewable painted surfaces; lead-contaminated dust; or lead-contaminated soil.

LEAD HAZARD EVALUATION

Visual Assessment: A visual evaluation of interior and exterior painted surfaces to identify specific conditions that contribute to lead-based paint hazards. The assessment is performed by a certified risk assessor or Housing Quality Standards (HQS) inspector trained in visual assessment.

Paint Testing: Testing of specific surfaces, by XRF (x-ray fluorescence) or lab analysis, to determine the lead content of these surfaces, performed by a certified lead-based paint inspector or certified risk assessor.

Risk Assessment: A comprehensive evaluation for lead-based paint hazards that includes paint testing, dust and soil sampling, and a visual evaluation. The risk assessment report identifies lead hazards and appropriate lead hazard reduction methods. A certified risk assessor must conduct the assessment.

Lead Hazard Screen: A limited risk assessment activity that can be performed instead of a risk assessment in units that meet certain criteria (e.g. good condition). The screen must be performed by a certified risk assessor. If the unit fails the lead hazard screen, a full risk assessment must be performed.

Clearance Examination: Clearance is performed after hazard reduction, rehabilitation or maintenance activities to determine if a unit is safe for occupancy. It involves a visual assessment, analysis of dust and soil samples, and preparation of report. A certified risk assessor, paint inspector, or clearance technician (independent from entity/individual conducting paint stabilization or hazard reduction) conducts clearance.

LEAD HAZARD REDUCTION

Paint Stabilization: An interim control method that stabilizes painted surfaces and addresses the underlying cause of deterioration. Steps include repairing defective surfaces, removing loose paint and applying new paint.

Interim Controls: Set of measures to temporarily control lead-based paint hazards. Interim control methods must be completed by qualified workers using safe work practices. Follow-up monitoring is needed.

Standard Treatments: A complete set of interim control methods that when used together temporarily control all potential lead hazards in a unit. Because they address all conditions, a risk assessment or other evaluation is not needed. Standard treatments must be completed by qualified workers using safe work practices. As with interim controls, follow-up monitoring is needed.

Abatement: Measures to permanently control (i.e. 20 years or more) lead-based paint or lead-based paint hazards.

LEAD-POSITIONING

Environmental Intervention Blood Lead Level: The level of lead in blood that requires intervention in a child under age six. This is defined as a blood lead level of 20 $\mu\text{g}/\text{dL}$ (micrograms per deciliter) of whole blood or above for a single test, or blood lead levels of 15-19 $\mu\text{g}/\text{dL}$ in two tests taken at least three months apart.

LEAD-BASED PAINT – KEY UNITS OF MEASUREMENT

μg (Microgram): A Microgram is $1/1000^{\text{th}}$ of a milligram (or one millionth of a gram). To put this unit into perspective, a penny weighs 2 grams. To get a microgram, you would need to divide the penny into 2 million pieces. A microgram is one of those two million pieces.

ft^2 (Square foot): One square foot is equal to an area that has a length of one foot (12 inches) and a width of one foot (12 inches).

$\mu\text{g}/\text{dL}$: Micrograms per deciliter used to measure the level of lead in children's blood to establish whether intervention is needed. A deciliter ($1/10^{\text{th}}$ of liter) is a little less than half a cup. As noted above, a microgram is the same weight as one penny divided into two million parts.

$\mu\text{g}/\text{gram}$: Micrograms per gram of sample, equivalent to parts per million (ppm) by weight. Used to measure lead in soil.

$\mu\text{g}/\text{ft}^2$: Micrograms per square feet is the measurement used to measure levels of lead in dust and soil samples. The clearance report should have the results listed in $\mu\text{g}/\text{ft}^2$ (micrograms per square foot).

mg/cm^2 : Milligrams per square centimeter, used for paint by XRF machines.

percent: Percent by weight, used usually for lead-based paint (1 percent = 10,000 $\mu\text{g}/\text{gram}$).

ppm: Parts per million by weight, equivalent to $\mu\text{g}/\text{gram}$ (10,000 ppm = 1 percent). Used to measure lead in paint and soil.

LEAD-BASED PAINT STANDARDS

Paint – Definition of Lead-Based Paint

Paint that contains at least:

- * 1 milligram per centimeters square (mg/cm^2) of lead;
- * 0.5 percent lead; or
- * 5,000 parts per million (ppm) lead by dry weight.

Dust – Thresholds for Lead-Contamination (Risk Assessment/Clearance)

- | | |
|-----------------------------------|-------------------------------|
| * Floors | 40 $\mu\text{g}/\text{ft}^2$ |
| * Interior window sills | 250 $\mu\text{g}/\text{ft}^2$ |
| * Window troughs (Clearance only) | 400 $\mu\text{g}/\text{ft}^2$ |

SOIL – THRESHOLDS FOR SOIL CONTAMINATION

- | | |
|---|---------------------------------|
| * Play areas used by children under age 6 | 400 $\mu\text{g}/\text{gram}$ |
| * Other areas | 1,200 $\mu\text{g}/\text{gram}$ |

APPENDIX E:

Performance Characteristics Sheets

Performance Characteristic Sheet

EFFECTIVE DATE: September 24, 2004

EDITION NO.: 1

MANUFACTURER AND MODEL:

Make: Niton LLC

Tested Model: XLp 300

Source: ^{109}Cd

Note: This PCS is also applicable to the equivalent model variations indicated below, for the Lead-in-Paint K+L variable reading time mode, in the XLi and XLp series:

XLi 300A, XLi 301A, XLi 302A and XLi 303A.

XLp 300A, XLp 301A, XLp 302A and XLp 303A.

XLi 700A, XLi 701A, XLi 702A and XLi 703A.

XLp 700A, XLp 701A, XLp 702A, and XLp 703A.

Note: The XLi and XLp versions refer to the shape of the handle part of the instrument. The differences in the model numbers reflect other modes available, in addition to Lead-in-Paint modes. The manufacturer states that specifications for these instruments are identical for the source, detector, and detector electronics relative to the Lead-in-Paint mode.

FIELD OPERATION GUIDANCE

OPERATING PARAMETERS:

Lead-in-Paint K+L variable reading time mode.

XRF CALIBRATION CHECK LIMITS:

0.8 to 1.2 mg/cm² (inclusive)

The calibration of the XRF instrument should be checked using the paint film nearest 1.0 mg/cm² in the NIST Standard Reference Material (SRM) used (e.g., for NIST SRM 2579, use the 1.02 mg/cm² film).

If readings are outside the acceptable calibration check range, follow the manufacturer's instructions to bring the instruments into control before XRF testing proceeds.

SUBSTRATE CORRECTION:

For XRF results using Lead-in-Paint K+L variable reading time mode, substrate correction is not needed for:

Brick, Concrete, Drywall, Metal, Plaster, and Wood

INCONCLUSIVE RANGE OR THRESHOLD:

K+L MODE READING DESCRIPTION	SUBSTRATE	THRESHOLD (mg/cm ²)
Results not corrected for substrate bias on any substrate	Brick	1.0
	Concrete	1.0
	Drywall	1.0
	Metal	1.0
	Plaster	1.0
	Wood	1.0

BACKGROUND INFORMATION

EVALUATION DATA SOURCE AND DATE:

This sheet is supplemental information to be used in conjunction with Chapter 7 of the HUD *Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing* ("HUD Guidelines"). Performance parameters shown on this sheet are calculated from the EPA/HUD evaluation using archived building components. Testing was conducted in August 2004 on 133 testing combinations. The instruments that were used to perform the testing had new sources; one instrument's was installed in November 2003 with 40 mCi initial strength, and the other's was installed June 2004 with 40 mCi initial strength.

OPERATING PARAMETERS:

Performance parameters shown in this sheet are applicable only when properly operating the instrument using the manufacturer's instructions and procedures described in Chapter 7 of the HUD Guidelines.

SUBSTRATE CORRECTION VALUE COMPUTATION:

Substrate correction is not needed for brick, concrete, drywall, metal, plaster or wood when using Lead-in-Paint K+L variable reading time mode, the normal operating mode for these instruments. If substrate correction is desired, refer to Chapter 7 of the HUD Guidelines for guidance on correcting XRF results for substrate bias.

EVALUATING THE QUALITY OF XRF TESTING:

Randomly select ten testing combinations for retesting from each house or from two randomly selected units in multifamily housing. Use the K+L variable time mode readings.

Conduct XRF retesting at the ten testing combinations selected for retesting.

Determine if the XRF testing in the units or house passed or failed the test by applying the steps below.

Compute the Retest Tolerance Limit by the following steps:

Determine XRF results for the original and retest XRF readings. Do not correct the original or retest results for substrate bias. In single-family housing a result is defined as the average of three readings. In multifamily housing, a result is a single reading. Therefore, there will be ten original and ten retest XRF results for each house or for the two selected units.

Calculate the average of the original XRF result and retest XRF result for each testing combination.

Square the average for each testing combination.

Add the ten squared averages together. Call this quantity C.

Multiply the number C by 0.0072. Call this quantity D.

Add the number 0.032 to D. Call this quantity E.

Take the square root of E. Call this quantity F.

Multiply F by 1.645. The result is the Retest Tolerance Limit.

Compute the average of all ten original XRF results.

Compute the average of all ten re-test XRF results.

Find the absolute difference of the two averages.

If the difference is less than the Retest Tolerance Limit, the inspection has passed the retest. If the difference of the overall averages equals or exceeds the Retest Tolerance Limit, this procedure should be repeated with ten new testing combinations. If the difference of the overall averages is equal to or greater than the Retest Tolerance Limit a second time, then the inspection should be considered deficient.

Use of this procedure is estimated to produce a spurious result approximately 1% of the time. That is, results of this procedure will call for further examination when no examination is warranted in approximately 1 out of 100 dwelling units tested.

TESTING TIMES:

For the Lead-in-Paint K+L variable reading time mode, the instrument continues to read until it is moved away from the testing surface, terminated by the user, or the instrument software indicates the reading is complete. The following table provides testing time information for this testing mode. The times have been adjusted for source decay, normalized to the initial source strengths as noted above. Source strength and type of substrate will affect actual testing times. At the time of testing, the instruments had source strengths of 26.6 and 36.6 mCi.

Testing Times Using K+L Reading Mode (Seconds)						
	All Data			Median for laboratory-measured lead levels (mg/cm ²)		
Substrate	25 th Percentile	Median	75 th Percentile	Pb < 0.25	0.25 ≤ Pb < 1.0	1.0 ≤ Pb
Wood Drywall	4	11	19	11	15	11
Metal	4	12	18	9	12	14
Brick Concrete Plaster	8	16	22	15	18	16

CLASSIFICATION RESULTS:

XRF results are classified as positive if they are greater than or equal to the threshold, and negative if they are less than the threshold.

DOCUMENTATION:

A document titled *Methodology for XRF Performance Characteristic Sheets* provides an explanation of the statistical methodology used to construct the data in the sheets, and provides empirical results from using the recommended inconclusive ranges or thresholds for specific XRF instruments. For a copy of this document call the National Lead Information Center Clearinghouse at 1-800-424-LEAD.

This XRF Performance Characteristic Sheet was developed by the Midwest Research Institute (MRI) and QuanTech, Inc., under a contract between MRI and the XRF manufacturer. HUD has determined that the information provided here is acceptable when used as guidance in conjunction with Chapter 7, Lead-Based Paint Inspection, of HUD's *Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing*.

APPENDIX F:

Certifications

DEPARTMENT OF PROFESSIONAL AND OCCUPATIONAL REGULATION
COMMONWEALTH OF VIRGINIA

EXPIRES ON
11-30-2015

9960 Mayland Dr., Suite 400, Richmond, VA 23233
Telephone: (804) 367-8500

NUMBER
3356000811

BOARD FOR ASBESTOS, LEAD, AND HOME INSPECTORS
LEAD RISK ASSESSOR LICENSE

ERIC DAVID CURETON

ROANOKE, VA 24016-0000



Jay W. DeBoer
Jay W. DeBoer, Director

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